SMART RAW PRODUCT MEASUREMENT USING EMBEDDED SYSTEM

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ABSTRACT :

In current world for measuring a raw product still we are using manual weight method, for measures the raw products, in the method there is low authentication is provided as so much advancement in technology still we using government id and fingerprint for authentication for buying raw products The All-India Ration Dealers Association has said that 35% of food grains supplied to distributed under the public distribution system (PDS) is being diverted to the black market. With rapid advancement in technology, we are trying to give a solution for this problem. We have designed a smart raw product measurement using Embedded system. The goal of this is to replace traditional measuring tools and to automatically measure the amount of consumption. With prior knowledge of the weight of the raw food in each compartment at the start of selling. By combining data from multiple weight sensors, the weight of individual can be accurately measured, localized and determine the compartment from which they were taken.

Keywords : *LED, LDR, Weight Cell, Raw Products, Sensors, Scanners, GSM Node, TCP Communication, I2C Communication*

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I. INTRODUCTION :

Smart raw product measurement is a revolutionary concept that is quickly revolutionizing the way raw products are measured, tracked, and managed. This innovative technology is transforming the way businesses measure and manage their raw product inventory, providing a comprehensive and accurate way to measure and monitor the quantity, of raw materials. Smart raw product measurement is a highly effective, cost-efficient solution that is providing businesses with accurate and timely information to help them make informed decisions. Smart raw product measurement is a sophisticated technology that uses sensors, scanners, and other devices to measure and monitor raw products. These devices can be used to track and measure raw product inventory in real-time. This real-time data is then collected, analysed, and stored in a secure database, which can be accessed remotely by authorized personnel. This data can be used to determine the quantity, and availability of raw products in a timely manner. By future updates, this technology can also implement in businesses to make better purchasing decisions, reduce waste, and improve the quality of their raw materials. In our method when a person places a government id on the scanner with authentication of biometrics, the food grains allocated by the government as well as message will send to server and to our product by using GSM Node. Our product acts a storage compartment after receiving the message the product will give accurate measurement of food grain to the authorised person. The amount of food grain which has been deliver that will show in the LED.

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II. RELATED WORKS

The research of Roberto Petrella [1], discusses that for requirement of high-performance servo drive systems, Position and rotor speed are required both at the motor's side for current control and for providing feedback information at the machine side for superior regulation of the load. Different kind transducers are normally employed, providing position and speed information in digital and/or analogical fashion. There are many manufacturers are there for replacement of digital transducers and with analogical once.

The research of Rajesh Kumar Kaushal [2], discusses that vision of Internet of things (IoT) is to connect anything at anytime and anywhere Utilizing IoT in the food supply chain enhances the quality of life by tracing and tracking the food condition and live sharing the obtained data with the consumers or the FSC supervisors. We have

wireless sensor unit to monitor the critical environmental parameters like temperature, humidity, light, moisture etc. We have DHT-11 sensor which will senses the humidity and temperature at shopping mall and give it to the Arduino. Arduino will convert this analog value into digital value compared to threshold value. If the parameter above or below the threshold value then actuators will turn on and control the temperature. If the parameter above or below the threshold value then actuators will turn on and control the temperature, we have LCD display, which displays the status of each sensor.

The research of Natalija Drekalovic [3] discusses that with the help of Internet of Things we can gathering the information as the cloud platform shown in figure 2.2 to monitoring the milk quality from the farmers, food producer, consumer, institution. To provide new innovation in business and consumer service/application like business process automation medical device functionality etc., One quality analysis per month is not sufficient for real needs of milk producers and processors since their activities require real-time information about current quality parameters.
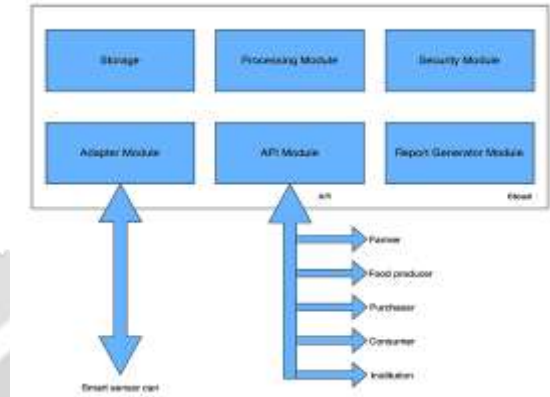

Fig 1: Cloud platform block-diagram

The research of Alexandru Popa [4] discusses that by using Internet of Things we can able to monitor food system using low-cost sensors, as shown in figure 2.3 It suited for monitoring the quality and safety of food products by recording the evolution of parameters like the quantity of pathogens agents, gases, temperature, humidity and storage period. It measures the trace gas emitted by food to affects the nutrition value of the food.
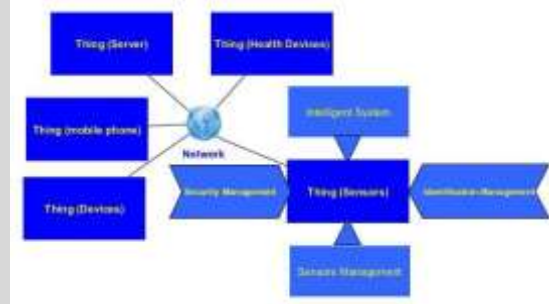

Fig 2:. Model of the Internet of Things

The research of Ankita Gulati [5] discusses that calculating the food nutritional value in Real time monitoring system with the help of remote logging, in mobile application a web server is used for storing the real time nutritional value, and the nutritional value can by calculate by temperature, moisture, light with help of mobile application user may monitor the quality of the food. The parameters like temperature, moisture, light does not affect the Raw products and we can store the raw food products for long period of time.

The research of Bhargavi Vijendra Sangam [6] discusses that by using the parameters of temperature, humidity, gases like nitrogen, oxygen, and trace gases, with the help of that monitoring the nutritional value and the information will be send through telegram as shown in figure . Then we can easily able to detect the low nutritional food, not measuring the Raw food products.
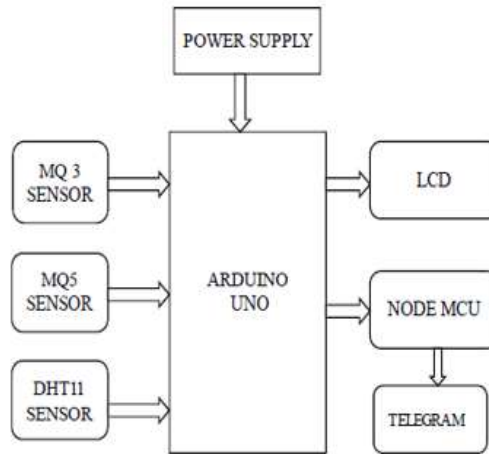
Fig 3: Architectural Design Block

The research of Sifat Rezwan [7] discusses that using of IoT managing the kitchen, medicine, restaurant inventory more efficient and hassle free. This will not only notify the user current inventory but also it automatically orders any items and delivered at their doorstep directly from their SIMS app. As it is an IoT based project, here Node MCU (ESP8266) is used to communicate with server. There are two types of communication is done in this project.

• TCP Communication
• I2C Communication

Through TCP connection the hardware system used to communicate with software by Node MCU Wi-Fi module. When user refresh one of compartment from cabinet a PhP code sends request for this compartment to Node MCU and Node MCU sends request to Arduino through I2C communication then Arduino runs its operation to get data for that compartment. That data is sent to the database through Node MCU. Update the server's database with compartment data. It individually measures the grocery items in the home it doesn't measures the massive storage and also it doesn't use public sectors.

The research of Andre Stuhlsatz [8] discusses that using of Internet of Things, smart and Embedded system, Sensing and acquiring reliable physical values are the fundamentals, not only for a predictive maintenance or quality assessment, with the help of data acquisition analyze the big data and sophisticated Industry 4.0 applications.

As shown in the block diagram figure 1 the hardware system is communicating with software by Node MCU Wi-Fi module through TCP connection. When user refresh one of compartment from cabinet a php code sends request for this compartment to Node MCU and Node MCU sends this request to Arduino through I2C communication then Arduino runs its operation to that compartment and gets data

III. SYSTEM ARCHITECTURE :

Our proposed system is to replace traditional monitoring tools and to automatically cover the amount of consumption. With former knowledge of the weight of the raw food in each cell at the launch of selling. By combining data from multiple weight sensors, the weight of existent can be directly measured, localized and determine the cell from which they were taken.

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Fig 4: Proposed Diagram
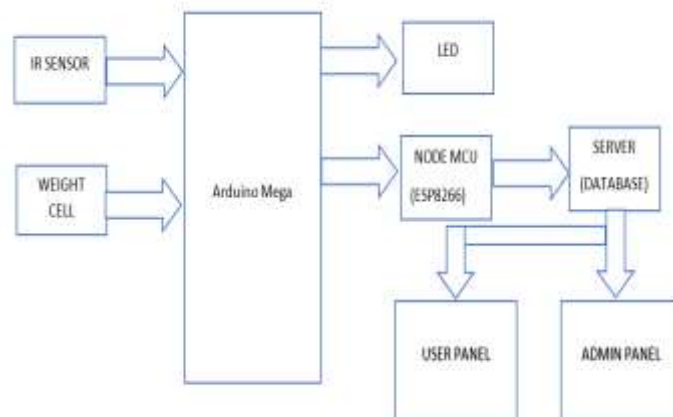
IV. HARDWARE DESIGN:

Light Dependent Resistor

LDR(Light Dependent Resistor) as the name states is a special type of resistor that works on the photoconductivity principle means that resistance changes according to the intensity of light. Its resistance decreases with an increase in the intensity of light. It's constantly used as a light sensor, light meter,.

Fig5: Light Dependent Resistor

Weight Cell

Weight Cell Weight cell is defined as a " weight dimension device necessary for electronic scales that display weights in integers. The weight on the weight cell is measured by the voltage change caused in the strain hand when it undergoes deformation

Arduino mega

Arduino Mega 2560 is a development electronic board predicated on the Atmega 2560 microcontroller. This board is a good match for systems that bear farther GPIO legs and memory space because it carries 16 analog legs and 54 digital NodeMCU (Node MicroController Unit) is an open- source software and attack development terrain erected around an affordable System- on-a-Chip (SoC) called the ESP8266. The ESP8266, designed and manufactured by Espress if Systems, contains the vital rudiments of a computer CPU, RAM, networking(WiFi), and indeed a modern operating system and SDK. That makes it an excellent choice for Internet of goods(IoT) systems of all kinds.

Fig 6: Arduino Mega

Node MCU (ESP8266)

The Node MCU(Node Micro Controller Unit) is an open- source software and attack development terrain erected around an affordable System- on- a- Chip(SoC) called the ESP8266. The ESP8266, designed and manufactured by Espress if Systems, contains the vital rudiments of a computer CPU, RAM, networking(WiFi), and indeed a modern operating system and SDK. That makes it an excellent choice for Internet of goods(IoT) systems of all kinds.

Fig 7: Node MCU

V. SOFTWARE DESIGN :

Server (Database)

A server is a computer program or device that provides a service to another computer program and its user, also known as the client. In a data center, the physical computer that a server program runs on is also constantly appertained to as a server
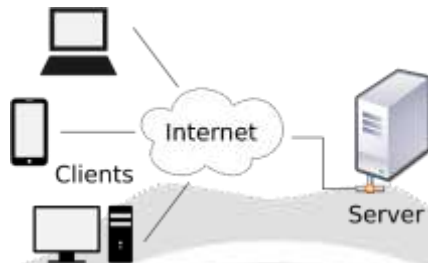

Fig 8: Server Database

Admin Panel

An admin panel enables administrators of an application, website, or IT system to manage its configurations, settings, content, and features and carry out oversight functions critical to the business. It allows them to view the state of the platform and take any action in the performance of their duties.

Fig 9: Admin Panel

User Panel

User Panels are regular meetings of service users about the quality of a service or other related topics. They help to identify the concerns and priorities of service users and can lead to the early identification of problems or ideas for improvements

Fig 10: User Panel
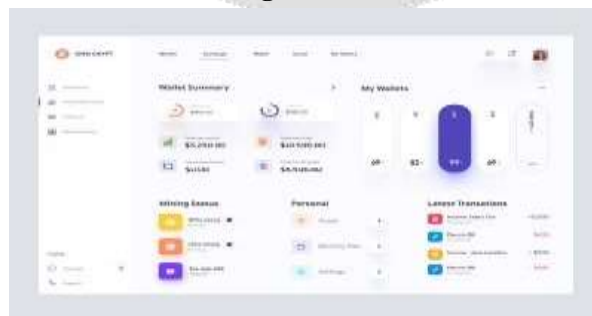
VI. SIMULATION OUTPUT:

By using the at mega microcontroller when a consumer government id is scanned by using biometric recognition, the suggestion communication will be transferred to the server. As well as the automated product, in the automated product, the raw product will be filled with manual system.

Fig 11: Simulated output

By using a weight cell and servo motor the weight will be measured automatically with the use of a coding algorithm and the consumer will get an accurate measurement of the product the workers will not sell the product in the black request and the government has the authority to access the user panel and admin panel. Using this system we can reduce the selling of the consumer product in the black request.

VII. CONCLUSION :

This system detects and sends the Real time information of the raw food products so that the authenticated person can cover the balance of the raw food in storage, so that government shoot the raw products accordingly, and may reduce selling of raw products in black request.

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